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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/748,305

12/30/2003

Stefan Bader

5367-73

8024

7590 07/25/2007  
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EXAMINER

KACKAR, RAM N

ART UNIT

PAPER NUMBER

1763

MAIL DATE

DELIVERY MODE

07/25/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/748,305

Applicant(s)

BADER ET AL.

Examiner

Ram N. Kackar

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 6/4/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-27 is/are pending in the application.
- 4a) Of the above claim(s) 4-13 and 20-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2, 14-19 and 23-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-2, 14-19 and 23-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In this instance recitation of "wherein the support step is configured to support the substrate so that a bottom surface of the substrate is disposed lower than an edge area of the substrate holder and a top surface of the substrate is disposed higher than said edge area" is new matter. There is no requirement of the type claimed. Paragraph 40 of the specification requires that the recess should be large enough to accommodate the substrate. It is noted that the thickness of the substrate will determine its projection above the recess. Thickness of the substrate is however, a variable quantity and may not properly limit the dimensions of the recess.

It has been held that Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-2, 14-19, 23 and 26 are rejected under 35 U.S.C. 102(e) as being unpatentable over Lie et al (US 6494955).**

Lie et al disclose a substrate support assembly in a CVD chamber (Fig 1) with gas inlet and exhaust and show a temperature-controlling surface having distinct circumferential steps (Fig 2A- 208, 226, 224 and 222) to provide variable gap for controlling heat conductivity (Col 3 line 54- Col 4 line35). The number of steps as can be seen is four, including the step in contact with the substrate.

Regarding the limitation of substrate height, it is noted that the projection of substrate depends upon its thickness. Further, it was held in re Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984) that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

In this case principle of operation in Lie et al is same as in the claimed invention.

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**5. Claims 1-2, 14-19, 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gurary et al (US 6001183).**

Gurary et al disclose a substrate holder which could be used in an epitaxial deposition having three dimensional structures for control of temperature at the surface of the susceptor by providing controlled thermal conductivity at different regions (Abstract, Fig 1-Fig 16). The stepped relief structure is disposed centrally especially at (Fig 16-113). The different structures could have smooth curved transition or stepped transition (Col 13 line 58- 62). The substrate could be mounted in a recess or on step in recess. The substrate could be edge supported as in Fig 16. The epitaxial deposition system as inherent and as disclosed used gases and discloses exhaust.

Regarding the number of steps, since steps could substitute a curved surface, it would be obvious to have steps to provide uniformity of temperature. Further it is easy to see that large number of steps with smaller dimensions approximates a curve. So it would be obvious to have more than four steps to provide better resolution of temperature control.

As discussed above regarding the limitation of substrate height, it is noted that the projection of substrate depends upon its thickness. Further, it was held in *re Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984) that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

In this case principle of operation in Lie et al is same as in the claimed invention.

- 6. Claims 1-2, 14-19, 23 and 26 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Gurary et al (US 6001183) in view of Lie et al (US 6494955).**

Gurary et al disclose a substrate holder which could be used in an epitaxial deposition having three dimensional structures for control of temperature at the surface of the susceptor by providing controlled thermal conductivity at different regions (Abstract, Fig 1-Fig 16). The different structures could have smooth curved transition or stepped transition (Col 13 line 58-62). The substrate could be mounted in a recess or on step in recess.

Gurary et al suggest stepped surface in place of a continuous curved surface as equivalent. As explained below Lie et al show stepped surface more explicitly. Lie et al show a temperature-controlling surface having distinct steps (Fig 2A) to provide variable gap for controlling heat conductivity (Col 3 line 54- Col 4 line35). The number of steps as can be seen is four, including the step in contact with the substrate.

Therefore having steps for gap control for controlling thermal conductivity for temperature profile control would have been obvious for one of ordinary skill in the art at the time of invention.

- 7. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gurary et al (US 6001183) or Lie et al (US 6494955) in view of Satoh (US 6063203).**

Gurary et al or Lie et al do not disclose surface roughness of the substrate holder.

However surface roughness of substrate holders are kept low for different reasons.

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Satoh teaches that lower surface roughness from 2-8 $\mu$ m helps in reducing frictional wear (Col 6 lines 45-55).

Therefore having surface roughness below 10  $\mu$ m would have been obvious for one of ordinary skill in the art at the time of invention.

**8. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gurary et al (US 6001183) or Lie et al (US 6494955) in view of Goodman et al (US 6454865).**

Gurary et al or Lie et al do not disclose the substrate holder made of solid silicon carbide material.

Goodman et al teach that Silicon carbide is a material of choice for susceptors in CVD applications (Col 7 lines 56-66) for its strength, thermal properties and resistance to high temperature.

Therefore having a material of SiC for susceptor of Gurary or Lie et al would have been obvious to one of ordinary skill in the art at the time of invention.

### ***Response to Arguments***

Applicant's arguments filed 6/4/2007 have been fully considered but they are not persuasive.

Claim 27:

Claim 27 has incorrect identifier. It should be (previously presented) and not (new).

According to the amendment, Lie et al is no longer an anticipatory rejection.

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Applicant argues that Gurary et al teaches away from the added limitation in claim 1. It is noted that the passage quoted from Gurary et al pertains to prior art wafer carriers and not to improved carriers invented by Gurary et al.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ram Kackar  
Primary Examiner AU 1763